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Measuring Angles With a Carpenter's Folding Ruler

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A table is given that permits marking 6-foot and 2-meter folding rulers so they can be used to measure angles directly. Accuracy varies from 2-1/2 to 5 degrees.

Have you ever needed a quick, handy way to measure angles in the field? Take time to mark a carpenter's folding ruler as described below and you will have an easy-to-use, portable tool. Table 1 gives the position of the "zero end" of a 6-foot ruler and of a 2-meter ruler for selected values of angle A and angle B (fig. 1).

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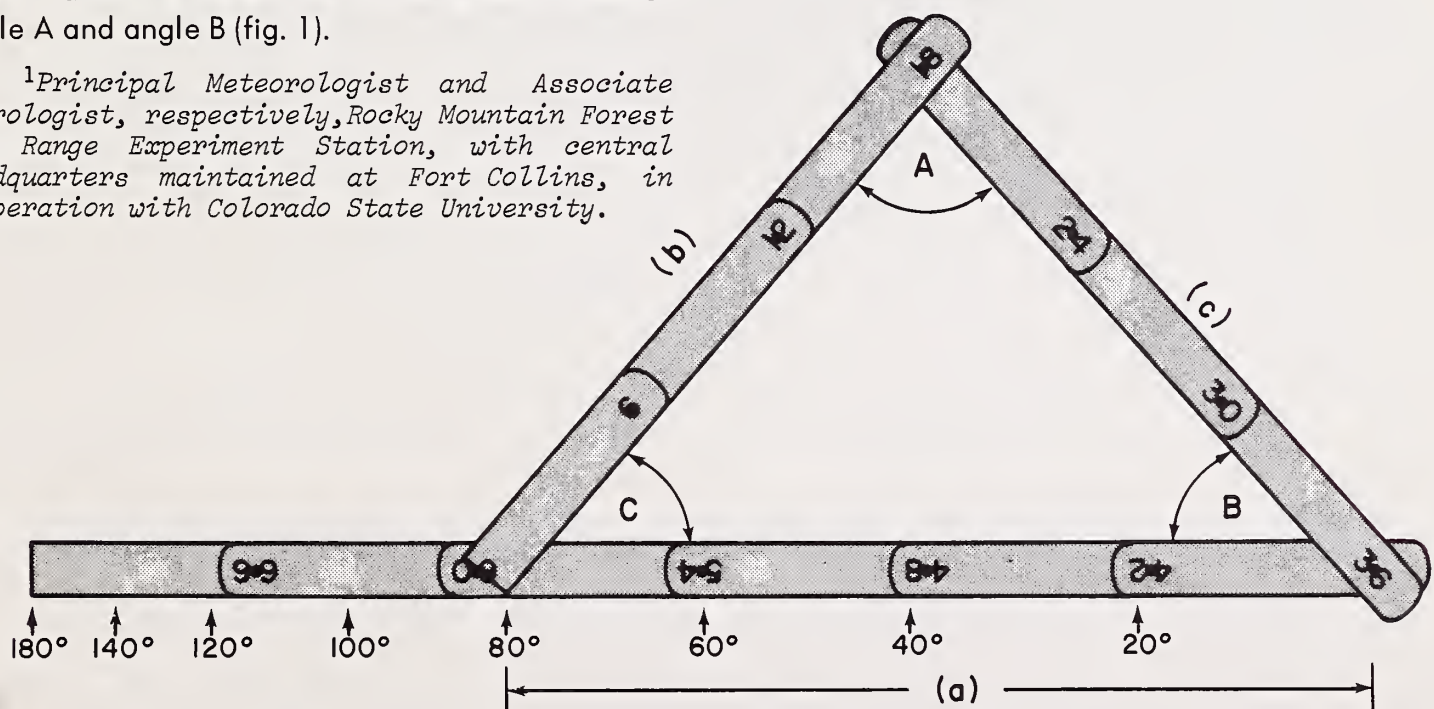


Figure 1.--A carpenter's folding ruler, folded to measure angles. The degree markings, a few of which are shown below the ruler, should be lettered directly on the ruler at the positions given in table 1. The value of angle A is read directly from the zero end of the marked ruler. The value of angle B (or C) can be calculated quickly. In this illustration, angle A is 80°, and angle B (or C) is $\frac{180^\circ - A}{2}$ or 50°.

How to Mark Ruler

Fold the ruler into an isosceles triangle (fig. 1) with the folds at 18 and 36 inches for a 6-foot ruler and at 50 and 100 cm. for a 2-meter ruler. Now mark the base of the triangle according to the values given in table 1. If the ruler will be used mostly to measure angles in the horizontal plane, use angle A values; if it will be used mostly for angles in the vertical plane, use angle B values. For example, on a 6-foot ruler to be used mostly for horizontal angles, the 10° mark will be at 39-1/8 inches; the 20° mark at 42-3/16 inches; and so forth. On a 2-meter ruler also marked for angle A, the 10° mark will be at 108.7 cm.; the 20° mark at 117.4 cm.

Markings can be made with paint, waterproof ink, or decals covered with plastic spray. A combination of numbers and symbols such as diamonds, dots, or arrows is probably most legible. The new markings will be easy to distinguish because the regular inch or cm. numbers appear upside down when the ruler is used to measure angles.

How to Measure Angles

For most horizontal angles, the ruler can be adjusted so angle A (fig. 1) matches the angle to be measured. The size of angle A can then be read directly from the "zero end" of the marked ruler. For many vertical angles, it may be more convenient to adjust the ruler so angle B matches the angle to be measured. In this case it is possible to read the value of angle A as before and then calculate B from the formula,

B = (180° - A) / 2

which is based on the fact that A + B + C = 180° for any triangle and that B and C are equal for an isosceles triangle.

If the ruler is used mostly for vertical angles, it may be more convenient to mark it with angle B rather than angle A values. In this case, a 6-foot ruler would have the 85° mark at 39-1/8 inches, the 80° mark at 42-3/16 inches, and so forth from columns 2 and 6 of table 1.

Table 1.--Data needed to mark a folding ruler so it can be used to measure angles (values computed from the formula $\sin \frac{A}{2} = \frac{a/2}{b}$ (see fig. 1) when b and c = 18 inches for a 6-foot ruler and 50 cm. for a 2-meter ruler)

Angle (degrees)		Position of "zero end"		Angle (degrees)		Position of "zero end"	
A	B	6-foot ruler	2-meter ruler	A	B	6-foot ruler	2-meter ruler
		Inches	Cm.			Inches	Cm.
10	85	39-1/8	108.7	90	45	61-1/2	170.7
15		40-11/16	113.1	95		62-1/2	173.7
20	80	42-3/16	117.4	100	40	63-5/8	176.6
25		43-13/16	121.6	105		64-5/8	179.3
30	75	45-5/16	125.9	110	35	65-1/2	181.9
35		46-13/16	130.1	115		66-3/8	184.3
40	70	48-5/8	134.2	120	30	67-3/16	186.6
45		49-13/16	138.3	125		67-7/8	188.7
50	65	51-3/16	142.3	130	25	68-5/8	190.6
55		52-5/8	146.2	135		69-5/16	192.4
60	60	54	150.0	140	20	69-13/16	194.0
65		55-5/16	153.7	145		70-5/16	195.4
70	55	56-7/8	157.4	150	15	70-13/16	196.6
75		57-7/8	160.9	155		71-1/8	197.6
80	50	59-1/8	164.3	160	10	71-1/2	198.5
85		60-5/16	167.6	165		71-11/16	199.1
				170	5	71-7/8	199.6